GENERAL RELATIVITY AND GRAVITATION

Volume 28, Number 1 **January 1996**

CONTENTS

RESEARCH ARTICLES

Classical Gravity and Quantum Matter Fields in Unified Field Theory
Horst-Heino von Borzeszkowski and Hans-Jürgen Treder

Variations of Constants and Red-shift in 6D Cosmology 15
Américo Peraza Alvarez and Yu. S. Vladimirov

Bianchi VI_0 Electric Type Cosmological Models in General Relativity with Stiff Fluid and Heat Conduction 27
S. R. Roy and S. K. Banerjee

Expanding Spherically Symmetric Models without Shear 35
S. D. Maharaj, P. G. L. Leach R. Maartens

Models of the Universe 51
Arthur E. Fischer

A Family of Strings with Spin 69
J. P. Krisch

Earth-Orbiting Low-Frequency Gravitational Wave Detector 77
L. V. Verozub

Factorization of Topology Changing Amplitudes in the Regge Calculus Approach to Quantum Cosmology 87
Danny Birmingham

Is There a Problem with Quantum Wormhole States in $N=1$ Supergravity? 97
P. V. Moniz

GENERAL RELATIVITY AND GRAVITATION

Volume 28, Number 2 **February 1996**

CONTENTS

RESEARCH ARTICLES

Linearity, Non Self-Interacting Spherically Symmetric Gravitational Fields, the "Sphereland Equivalence Principle" and Hamiltonian Bubbles 117
E. I. Guendelman and A. I. Rabinowitz

Waves in Five-Dimensional Relativity Theory 129
A. Billyard and P. S. Wesson

Double Duality and Hidden Gauge Freedom in the Poincaré Gauge Theory of Gravitation 137
Vadim V. Zhytnikov

Progressing Wave Perturbations of Cosmological Spacetimes 163
W. E. Couch and R. J. Torrence

Strains and Rigidity in Black-hole Fields 177
F. de Felice and S. Usseglio-Tomasset

Kinematics and Dynamics of $f(R)$ Theories of Gravity 191
Steve Rippl, Henk van Elst, Reza Tavakol and David Taylor

A Method of Reduction of Einstein's Equations of Evolution and a Natural Symplectic Structure on the Space of Gravitational Degrees of Freedom 205
Arthur E. Fischer and Vincent Moncrief

Quantum Conformal Superspace 219
Arthur E. Fischer and Vincent Moncrief

Quadrupole Anisotropy from Photon Quantum Effects 237
Alexei V. Nesteruk and Roy Maartens

GENERAL RELATIVITY AND GRAVITATION

Volume 28, Number 3 **March 1996**

CONTENTS

EDITORIAL 249

RESEARCH ARTICLES

Exact Bianchi Type V Imperfect Fluid Solutions 251
B. K. Nayak and B. K. Sahoo

Decoherence, Correlation, and Unstable Quantum States in Semiclassical Cosmology 263
Mario Castagnino and Fernando Lombardo

A Spin Polarized Disc. II 287
J. P. Krisch and L. L. Smalley

Ricci and Matter Collineations in Space-time 299
G. S. Hall, I. Roy and E. G. L. R. Vaz

Space-times Admitting a Three-dimensional Conformal Group 311
J. Carot, A. A. Coley and A. M. Sintes

The Newtonian Limit in a Family of Metric Affine Theories of Gravitation 339
D. E. Barraco, R. Guibert, V. H. Hamity and H. Vucetich

Neighbours of Einstein's Equations: Connections and Curvatures 347
Ingemar Bengtsson

The Embedding of General Relativity in Five Dimensions 365
Carlos Romero, Reza Tavakol and Roustam Zalaletdinov

BOOK REVIEW

Mach's Principle: From Newton's Bucket to Quantum Gravity. Eds. Julian B. Barbour and Herbert Pfister 377
H.-J. Schmidt

GENERAL RELATIVITY AND GRAVITATION

Volume 28, Number 4 **April 1996**

CONTENTS

RESEARCH ARTICLES

Relativistic Equipartition 379
Arthur Komar

Gott Time Machines in Anti-de Sitter Space 387
Sören Holst

Absence of a Gravitational Analog to the Meissner Effect 405
Corneliu Ciubotariu and Maricel Agop

The Optical-Mechanical Analogy in General Relativity: Exact Newtonian Forms for the Equations of Motion of Particles and Photons 413
James Evans, Kamal K. Nandi and Anwarul Islam

Vacuum Energy and Inertial Dragging 441
Ivar Farup and Øyvind Grøn

Canonical Connections of Finsler Metrics and Finslerian Connections on Riemannian Metrics 451
José G. Vargas and Douglas G. Torr

Physical Properties of the 6D STMC Universe 471
Takao Fukui

Geometric Interpretation of the Mixed Invariants of the Riemann Spinor 481
Barry M. Haddow

GENERAL RELATIVITY AND GRAVITATION

Volume 28, Number 5 **May 1996**

CONTENTS

RESEARCH ARTICLES

Particle Creation if a Cosmic String Snaps 511
A. H. Bilge, M. Hortaçsu and N. Özdemir

Møller's Energy-Momentum Complex — Once Again 527
G. Lessner

Some D Type Metric Forms for Spacetimes with Shear, Nongeodesic, and Nondiverging Principal Null Congruences 537
Jerzy Klemens Kowalczyński

A Connection Dynamic Theory of Gravity 549
Guoying Chee

String Theory and Cosmology 565
M. C. Bento and O. Bertolami

Particle Decay and Bulk Dissipative Stress in the Early Universe 573
Diego Pavón, Jérôme Gariel and Gerard Le Denmat

On Gravity's Role in Quantum State Reduction 581
Roger Penrose

Relativistic Kinetic Theory Description of Thick Einstein Shells 601
G. L. Comer

Earth-based Gravitational Wave Detection from Pulsars 613
Walter Velloso, Fabrizio Barone, Enrico Calloni, Luciano Di Fiore, Aniello Grado, Leopoldo Milano, and Guido Russo

Inhomogeneous Kaluza–Klein Model with Heat Flow 633
B. Bhui, A. Banerjee and S. Chatterjee

BOOK REVIEW

Ideas and Methods of Supersymmetry and Supergravity. By I. L. Buchbinder and S. Kuzenko. 641
M. Grisaru

GENERAL RELATIVITY AND GRAVITATION

Volume 28, Number 6 **June 1996**

CONTENTS

RESEARCH ARTICLES

A Primordial Cosmological Scenario and the Horizon Problem 645
Flávio Gimenes Alvarenga and Júlio César Fabris

Finite Self-Energy of Pointlike Sources for the Reissner–Nordström Metric 663
L. Herrera and V. Varela

Expanding Models with a Varying Cosmological Term and Bulk Stress 679
Vicenç Méndez and Diego Pavón

Ricci Collineations of the Bianchi Type II, VIII, and IX Space-times 691
I. Yavuz and U. Camci

Variable Rest Masses in 5-dimensional Gravitation confronted with Experimental Data 701
Luis Anchordoqui, Graciela Birman, Santiago Perez Bergliaffa and Héctor Vucetich

Integration in the GHP Formalism I: A Coordinate Approach with Applications to Twisting Type N Spaces 707
Garry Ludwig and S. Brian Edgar

Gravitational Collapse of a Charged and Radiating Fluid Ball in the Diffusion Limit 735
W. Barreto and A. Da Silva

Gravitation, Torsion, and String Theory 749
Richard T. Hammond

Nonlinear Gauge Realization of Spacetime Symmetries Including Translations 759
J. Julve, A. López-Pinto, A. Tiemblo and R. Tresguerres

BOOK REVIEWS

Geometry of Constrained Dynamical Systems. Ed. John M. Charap. 769
Atsushi Higuchi

Relativity Today. Ed. R. P. Kerr and Z. Perjés. 773
David Chellone

GENERAL RELATIVITY AND GRAVITATION

Volume 28, Number 7 **July 1996**

CONTENTS

RESEARCH ARTICLES

Naked Singularities in a Self-Similar Tolman–Bondi Spacetime 775
A. Sil and S. Chatterjee

Vacuum Spacetimes with a Two-Dimensional Orthogonally Transitive Group of Homothetic Motions 787
Charalampos Kolassis

Perfect Fluid Space-times with a Two-dimensional Orthogonally Transitive Group of Homothetic Motions 805
Ch. Kolassis and J. B. Griffiths

Euclidean Action, Nucleation Energy and the Dimensionality of Space-time 833
Franz Embacher

Critical Behavior of Extremal Kerr–Newman Black Holes 843
Osamu Kaburaki

On a Fermat Principle in General Relativity. A Morse Theory for Light Rays 855
Fabio Giannoni and Antonio Masiello

LETTER

How Should We Measure Spatial Distances? 897
Hans-Jürgen Schmidt

GENERAL RELATIVITY AND GRAVITATION

Volume 28, Number 8 **August 1996**

CONTENTS

RESEARCH ARTICLES

Cosmological PPN Formalism and Non-Machian Gravitational Theories 905
G. Dautcourt

Spherically Symmetric Nonstatic Perfect Fluid Solutions with Shear 919
Eduard Herlt

Cosmology of General Relativity without Energy-Momentum Conservation 935
A. S. Al-Rawaf and M. O. Taha

Averaged Lagrangians and MacCallum–Taub's Limit in Macroscopic Gravity 953
Roustam M. Zalaletdinov

Cylindrically Symmetric Cosmological Models in Kaluza–Klein Spacetime 981
L. K. Patel and Naresh Dadhich

Geodesic Multiplication and BRST-like Operators 991
Piret Kuusk and Eugen Paal

Isometric Embedding for Homogeneous Compact 3-Manifolds 999
István Ozsváth and Engelbert L. Schücking

Thermal Conditions for Scalar Bosons in a Curved Spacetime 1013
Carlos E. Laciana

BOOK REVIEWS

Theories of Everything. By J. D. Barrow. 1027
Viktor Gorgé

Force and Geometry in Newton's Principia. By F. De Gandt. 1029
Reza Mansouri

GENERAL RELATIVITY AND GRAVITATION

Volume 28, Number 9 **September 1996**

CONTENTS

RESEARCH ARTICLES

Gauge-Invariant Perturbations for a Collapsing Dust Sphere 1033
Haydeh Sirousse-Zia

On the Equivalence Principle in Quantum Theory 1043
Claus Lämmerzahl

A Covariant Frame to Test Special Relativity Including Relativistic Gravitation 1071
Ph. Tourrenc, T. Melliti and J. Bosredon

Applying Gradient Expansion to a Perfect Fluid and Higher Dimensions 1089
Takeshi Chiba

On the Algebraic Structure of Second Order Symmetric Tensors in 5-Dimensional Space-times 1107
G. S. Hall, M. J. Rebouças, J. Santos and A. F. F. Teixeira

Motion of Test Particles around Monopoles 1115
Subenoy Chakraborty

Massive Photons in General Relativity 1121
Justin C. Huang, N. O. Santos and Antares Kleber

Entropy Generation in Cosmological Particle Creation 1129
Mario A. Castagnino, Fabián H. Gaioli and Daniel M. Sforza

Principal Mappings of 3-dimensional Riemannian Spaces into Spaces of Constant Curvature 1139
Lluís Bel

Extremally Accelerated Observers in Stationary Axisymmetric Spacetimes 1151
O. Semerák

BOOK REVIEWS

Effective Action in Quantum Gravity. By I. L. Buchbinder, S. D. Odintsov, I. L. Shapiro 1157
S. Reuter

Bangs, Crunches, Whimpers, and Shrieks. By John Earman 1159
H.-J. Schmidt

GENERAL RELATIVITY AND GRAVITATION

Volume 28, Number 10 **October 1996**

CONTENTS

ESSAY

Gravitationally Induced Neutrino-Oscillation Phases 1161
D. V. Ahluwalia and C. Burgard

RESEARCH ARTICLES

Back-reaction of the Kerr Black Hole. A Thermodynamical Approach 1171
Li-Xin Li

Cosmological Solutions for the Coupled Einstein–Yang–Mills–Higgs Equations 1177
U. Ochs and M. Sorg

Geodesic and Path Motion in the Nonsymmetric Gravitational Theory 1221
J. Légaré and J. W. Moffat

On General and Restricted Covariance in General Relativity 1251
Roustam Zalaletdinov, Reza Tavakol and George F. R. Ellis

Integrable Multicomponent Perfect Fluid Multidimensional Cosmology. I 1269
U. Kasper and A. Zhuk

GENERAL RELATIVITY AND GRAVITATION

Volume 28, Number 11 **November 1996**

CONTENTS

ESSAYS

Physics with Nonperturbative Quantum Gravity: Radiation from a Quantum Black Hole 1293
Marcelo Barreira, Mauro Carfora and Carlo Rovelli

Birth of the Universe as Quantum Scattering in String Cosmology 1301
M. Gasperini and G. Veneziano

RESEARCH ARTICLES

The Sources of the A and B Degenerate Static Vacuum Fields 1309
M. A. P. Martins

Distinguishability of Weyl- from Lorentz-Spacetimes by Classical Physical Means 1321
Udo Schelb

Gauge-Invariant Cosmological Perturbation Theory for Collisionless Matter: Application to the Einstein–Liouville System 1335
Zbigniew Banach and Slawomir Piekarski

The Hamiltonian Constraint in the Teleparallel Equivalent of General Relativity 1361
José W. Maluf

Wormholes in Vacuum Brans–Dicke Theory 1377
Xing-Guo Xiao, B. J. Carr and Liao Liu

The Quantization of Geodesic Deviation 1385
M. D. Roberts

Energy and Angular Momentum of Charged Rotating Black Holes 1393
J. M. Aguirregabiria, A. Chamorro and K. S. Virbhadra

COMMENT 1401

REPLY 1409

BOOK REVIEWS

REDUCE for Physicists. By Norman MacDonald 1415
Luis A. Núñez

Chaos and Complexity. Ed. R. Russell, N. Murphy, A. Peacocke. 1417
Hans-Jürgen Schmidt

GENERAL RELATIVITY AND GRAVITATION

Volume 28, Number 12 **December 1996**

CONTENTS

ESSAYS

Relativity at Action or Gamma-Ray Bursts 1421
Tsvi Piran

Gravitational Critical Phenomena in the Realm of the Galaxies and Ising Magnets 1427
D. Hochberg and J. Pérez-Mercader

RESEARCH ARTICLES

Two Simple Models for Gravitational-Wave Modes of Compact Stars 1433
Nils Andersson

Non-Static Non-Conformally Flat Fluid Plates of Embedding Class One 1447
Y. K. Gupta and J. R. Sharma

A Conformal Mapping and Isothermal Perfect Fluid Model 1455
Naresh Dadhich

BOOK REVIEW

Quantum Field Theory in Curved Spacetime and Black Hole Thermodynamics. By Robert M. Wald 1465
Bruce P. Jensen

ANNOUNCEMENT 1469

ANNOUNCEMENT 1471

AUTHOR INDEX TO VOLUME 28 1473